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3. ENVIRONMENTAL SETTING

3.1 SUMMARY OF DNR-MANAGED LANDS

The Washington Department of Natural Resources (DNR) manages more than 5 million acres of state-owned lands, including aquatic lands and uplands. Tidelands and beds of marine waters and navigable lakes and streams make up the 2.4 million acres of aquatic lands managed by DNR. The 2.9 million acres of uplands primarily consist of lands granted to the state by the federal government at the time of statehood, tax-delinquent logged and abandoned timberlands that had reverted to the counties and were transferred to the state, timberlands purchased to be managed as state forests, and community college reserve lands. These uplands are managed, in trust, for the various beneficiaries. Income is derived from these uplands through leases and the sale of minerals and renewable resources. In addition, DNR manages uplands for Natural Area Preserves, Natural Resource Conservation Areas, administrative sites, and recreation areas. The forested trust lands in western Washington are managed by DNR under a Habitat Conservation Plan, which also covers three planning areas on the east side of the Cascades. The Habitat Conservation Plan is a long-term land management plan authorized under the Endangered Species Act to conserve threatened and endangered species, while carrying out management activities on the trust lands (DNR 1997).

3.1.1 Land Covered by the Proposal

The proposed action described in this Environmental Impact Statement covers DNR-managed forested lands west of the Cascade Crest. Included are the state trust lands: federal grant lands, state forest lands (formerly known as Forest Board lands, RCW 79.02.010(10)), and community college reserves, totaling approximately 1.5 million acres. Table 3.1-1 presents the approximate acreage for each category of trust land covered by the proposed action.

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Table 3.1-1. Acreage of DNR-Managed Trust and other Forested Lands in Western Washington (by Trust Category)

Trust #	Trust Name	Total Acres	Acres	
			Forested	Nonforested
1	State Forest - Transfer[1/]	523,704	490,304	33,400
2	State Forest - Purchase[1/]	79,321	73,300	6,021
3	Common School and Indemnity	556,414	504,715	51,698
4	Agricultural School	27,579	26,210	1,369
5	University - Transferred	40,832	38,554	2,279
6	Charitable/Educational/Penal and Reformatory Institute	29,289	26,810	2,479
7	Capitol Grant	91,715	85,460	6,255
8	Normal School	34,757	32,549	2,208
9	Escheat	3,963	3,592	371
10	Scientific School	56,268	52,995	3,273
11	University - Original	2,891	2,576	315
12	Community College Forest Reserve	3,341	3,079	262
	Other non-revenue producing lands			
	Administrative Sites and Other Lands[2/]	5,730	4,671	1,059
	Natural Area Preserve[2/]	14,182	7,286	6,896
	Natural Resources Conservation Area[2/]	59,762	38,601	21,160
Total		**1,529,746**	**1,390,704**	**139,045**

1/ RCW 79.02.010(10)
2/ Not managed for timber production.
Data Source: DNR POCAALL Geographic Information System layer.

The lands managed by DNR vary from scattered separate parcels of less than 40 acres to large contiguous blocks in excess of 110,000 acres. These lands are distributed throughout western Washington.

3.1.2 Land Use

As described above, the western Washington state trust lands encompass federal grant lands, state forest lands, and community college reserves managed by DNR. All but approximately 139,000 acres within these trust lands are forested. Non-forested land within this area includes natural features such as wetlands, ponds, exposed rock and soil, and perennial snowfields. Other land is maintained in a nonforested condition for specific uses such as utility and road rights-of-way and communication tower sites.

Of the approximately 1,390,700 acres of forested land considered in this analysis, approximately 865,000 acres are currently managed by DNR to grow and harvest timber, although these lands include areas where little or no harvest occur under current policies

and procedures, such as riparian areas. Approximately 486,000 acres are currently in a long-term deferred status (beyond the decade-long planning period). They include recreation sites, old forest research areas, gene pool reserves, and other areas. Approximately 40,000 acres are currently in a short-term deferred status (released within the planning period), and include northern spotted owl habitat circles.

In order to plan efficiently and to manage for regional variation, the western Washington forested state trust lands were divided into six Habitat Conservation Plan (HCP) Planning Units as part of the HCP development process. Five of these HCP Planning Units were delineated by clustering Water Resource Inventory Areas (as defined by the Washington State Department of Ecology, and that drain to common water bodies)**.** Because of the unique history and role of the Olympic Experimental State Forest HCP Planning Unit, it was considered separately. The five Westside HCP Planning Units are also used in this document to identify regional variation of environmental effects.

3.1.3 Ownerships in Western Washington

DNR-managed lands in western Washington covered by the Habitat Conservation Plan are interspersed among a variety of other ownerships. Map 1 shows the distribution of this land. Table 3.1-2 summarizes the approximate acreage held by various landowners in western Washington.

This pattern of ownership has varied since statehood. DNR's active land exchange program has consolidated many scattered parcels of state trust forestlands into larger, more manageable blocks. Exchanges are expected to continue into the future to position assets to benefit the trusts.

Table 3.1-2. Acreage by Ownership within Western Washington in 2003

Landowner/Manager/Use	Acres[1/]	Percent of Total[2/]
DNR	1,500,000	9.6
Other Washington State Land	100,000	0.6
Federal Land	5,600,000	35.7
City and County Land	200,000	1.2
Private Industrial Forest Land	3,800,000	24.2
Private Non-Industrial Forest Land	3,800,000	24.2
Tribal Lands	300,000	1.9
Other	400,000	2.5
Total	**15,700,000**	**100**

[1/] Acre figures rounded to nearest 100,000 acres.
[2/] Percents are not exact due to rounding.
Data Source: DNR MASK Geographic Information System layer.

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3.2 CLIMATE

Washington's climate is controlled by three factors: 1) location on the windward coast of the Pacific Ocean; 2) the Cascade mountain range, which runs north to south just west of center through the state; and 3) the semi-permanent high- and low-pressure regions located over the north Pacific Ocean. These factors combine to produce dramatically different conditions within relatively short distances. The Cascade Range, for instance, blocks the initial thrust of Pacific storms into eastern Washington, while protecting western Washington from the polar-continental influence. Thus, western Washington has a marine-influenced climate.

Successive moisture-laden storms move into the Pacific Northwest during late fall, winter, and early spring. They are intercepted first by coastal ranges (the Olympic Mountains and Willapa Hills) and then by the Cascade Mountains. From late spring to early fall, the Pacific high-pressure area moves progressively farther north, weakening storms and limiting rainfall.

Annual precipitation ranges from 75 inches along the coast to 175 inches along the western slopes of the Olympic Mountains and nearly 100 inches in the Willapa Hills. The rain shadow effect of the Olympic Mountains results in only 16 to 25 inches of rain on the northeastern part of the Olympic Peninsula and in parts of the San Juan Islands. From the Puget Sound lowlands south to the Columbia River, the mean annual precipitation is 40 to 60 inches. Precipitation increases along the west slopes of the Cascades, reaching 120 inches annually in some places.

Prevailing winds are generally southwesterly over the state from late fall to early spring and northwesterly and lighter during the rest of the year. The most intense storms take place in late fall and early winter. Wind velocities range from 50 to 70 miles per hour or higher along the coast almost every winter. Wind speeds approaching or exceeding 100 miles per hour have been observed occasionally on coastal ridges. Wind speeds inland are lower during these storms but have been observed at 50 to 60 miles per hour, and gusting higher.

In general, western Washington has 10 to 12 lightning storms each year, mostly along the western slopes of the Cascades. Rain usually accompanies lightning storms. Outbreaks of "dry lightning" are rare in western Washington.

The sun shines about 24 percent of the time on December days in western Washington. In July, the figure is typically about 61 percent. Frost-free days begin in late April and continue to early November.

3.3 FOREST DISTURBANCE ON FORESTED TRUST LANDS

Major disturbance events, both natural- and human-caused, have defined the current condition of western Washington forested state trust lands. Windstorms, which create chaotic patterns of broken and windthrown trees, have shaped Washington forests throughout the centuries. Examples of notable historic windstorms are the 1921 storm on the western Olympic Peninsula and the Columbus Day storm of 1962, which blew down

thousands of acres of mature timber in western Washington. Major ice storms, such as the 1955 freeze, have also changed the structure of forests all over western Washington. Today, numerous forest stands containing trees with crooked boles and forked tops serve as reminders of the millions of treetops killed by this freeze. Fire, both natural- and human-caused, has historically been one of the great shapers of forest composition in both eastern and western Washington. As an example, parts of the 94,055-acre Yacolt Burn State Forest in southwestern Washington burned several times between 1902 and 1952. Today, this area is forested with young Douglas-fir trees and a few old remnant trees in riparian areas and ravines.

While a century of fire control has played a key role in creating the current forestland conditions in western Washington, timber harvest is probably the greatest human influence. Most forested trust lands have been logged at least once in the last 100 years. Much land in western Washington was clearcut and logged from 1910 to 1930**,** abandoned, and then acquired later by the state. Remnants of logging railroads and abandoned truck roads are scattered on state lands and bear witness to the intensity of logging in western Washington in the early 20th century. Fire scars on residual trees and charred old-forest stumps show the effects of frequent fires that followed the first logging in those early years. Large parts of these forests naturally reseeded themselves from trees that survived the fires and from the hardwoods and other species in unburned riparian areas. After the fires, alder flourished in some landscapes that were once dominated by old conifers. The presence of large conifer stumps in many alder stands shows this vegetation change.

Since the 1960s, DNR has used a sustainable harvest approach in managing state trust forestlands. Designated areas are harvested and regenerated each year. Most early regeneration efforts concentrated on establishing Douglas-fir in recently clearcut areas. Today, a mix of species is typically prescribed to conform to the native environmental characteristics of a site.

3.4 GENERAL FOREST STAND CONDITIONS

Conifers dominate the majority of the forests on forested trust lands in western Washington. Less than 12 percent of the stands are dominated by hardwood trees (some of these stands are mixed with conifers). There are 2,000 acres of "natural" old forest that have never been harvested. More than 141,000 acres support multi-storied forests of large-diameter (30 inches and larger) Douglas-fir, western red cedar, and western hemlock with the varying degrees of structural complexity typically associated with older forests. As noted previously, most forested trust lands have been logged at least once in the last 100 years.

DNR categorizes forestlands as even-aged or uneven-aged. In general, even-aged stands predominate in western Washington and are categorized in terms of the dominant age class of trees within a stand. However, while the dominant age or size class is determined and tracked, any acre of a forest stand may contain a mix of different age and/or size of trees, just as a mix of tree species will be present within the vast majority of stands.

Because trees of the same age can vary greatly in size due to variations in site conditions and stand density, size class is often a more useful way to display forest conditions (Table 3.4-1).

Chapter 4 of this Final Environmental Impact Statement presents detailed information about the existing conditions (also referred to as "affected environment") of the key resource areas for which the effects of this proposed action are being assessed.

Table 3.4-1. Dominant Size Class Distribution for Western Washington Forested State Trust Lands in 2002

Size Class (diameter in inches)	Acres	Percent
0-9	345,000	25
10-19	246,000	18
20-29	659,000	47
30+	141,000	10
Total Acres	**1,391,000**	**100**

Data Source: DNR FRIS database.

3.5 ECOREGIONS

The U.S. Environmental Protection Agency has established a system of ecoregion designations based on soils, topography, climate, potential vegetation, and land use (Omernik and Gallant 1986; Omernik 1987). The ecoregion descriptions described below provide a general synopsis of the more important characteristics that affect aquatic and terrestrial ecosystems. The western Washington forested state trust lands fall within the Coastal Range, Puget Lowland, and Cascade Ecoregions.

3.5.1 Coastal Range

In Washington, the Coastal Range Ecoregion extends from the Olympic Peninsula (excluding the Olympic Mountains) through the coastal area to the Willapa Hills. This region is influenced by high levels of rainfall due to the interaction of the marine weather systems and the mountains. The mountains are generally rugged with steep canyons. Tributary streams are typically short and have a steep gradient, which result in rapid runoff. Peak flows generally occur during the rainstorms of December and January as well as during snow melt in the spring. Stream flows are at their lowest in the summer when there is less rain. Forests in this ecoregion generally support dense stands of conifers (Sitka spruce, western hemlock, Douglas-fir, and western red cedar) and, in some cases, red alder, and many shrubs and herbaceous plants.

3.5.2 Puget Lowland

The Puget Lowland Ecoregion in Washington lies between the Coastal Range and the Cascade Mountains. The area is relatively flat and soils are composed of alluvial and lacustrine deposits, which are of glacial origin north of Centralia. Because of the rain

shadow effect of the mountains bordering this ecoregion to the west, average rainfall is moderate compared to the ecoregions to the east and west. River flows are sustained by streams with headwaters in the adjacent mountains. Peak flows can occur between fall and spring, depending on snow pack and storm events. Forested areas support dense stands of conifers (western hemlock, Douglas-fir, and western red cedar) and hardwoods. Much of the land in this region has been converted to urban, industrial, and agricultural uses.

3.5.3 Cascades

The Cascade Ecoregion in Washington includes the Cascade and the Olympic Mountains. Several peaks above 10,000 feet in elevation occur along the crest of the Cascades, which averages over 4,500 feet above sea level. The Olympic Mountains include several peaks over 6,000 feet. Dams and reservoirs are common at lower elevations in this ecoregion. Precipitation is highest between October and March, and much of it falls as snow. Peak flows generally occur during periods of heavy rainfall and rapid snowmelt. Forests in this ecoregion generally support dense stands of conifers (western hemlock, Douglas-fir, silver fir, noble fir, and western red cedar), and understory vegetation can be dense. Alpine meadows consist of grasses and sedges.

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